Interactive spatial augmented reality in the Allard-Pierson museum: Exploration of cultural artifacts by simple finger pointing

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Exploration of cultural artifacts by simple finger pointing

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The visual and material properties of cultural heritage artifacts provide important information about their history. For example, traces of wear and tear inform us about an object's use. However, changes caused by manual handling or corrosion might also result in loss of either geometric properties, such as the deterioration of fine inscriptions, or appearance properties, such as fading color.

Often, heritage institutions wish to inform visitors about these lost physical properties. Traditionally, this is done through the separate display of the physical artifact and additional textual or visual information. However, this approach requires considerable cognitive attention from the visitor, who is expected to successfully link the information provided by both resources, and thus hinders the process of understanding.

This demonstration showcases an exhibit currently on display in the Allard Pierson Museum in Amsterdam (the Netherlands) which contains a relief fragment from the wall of a mastaba[1] (a type of ancient Egyptian tomb).This fragment, which was originally colored, shows part of a scene of an ox being butchered, while an accompanying text urges the butcher to hurry up, as well asa flute player, accompanied by a descriptive text. This limestone relief is dated within the 4th or 5th dynasty (c. 2600-2350 BC). All the original pigmentation has been lost.

We use spatial augmented reality to superimpose the original colors directly onto the artifact by means of a video projector. To encourage an interactive experience and prolonged attention, the color will only become visible where a visitor finger points at the relief. As a result, switching between the real artifact and the additional information is natural and visitors are encouraged to individually explore the various sections of the relief. The finger tracking is done by infrared sensing with the LeapMotion device, and for the color projection, a 3D acquisition of the original artifact was used.

Our setup makes advanced 3D analysis accessible to the greater public with an everyday gesture, by naturally combining the inspection of the real object and the virtual object in a co-located interactionand visualization space.

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